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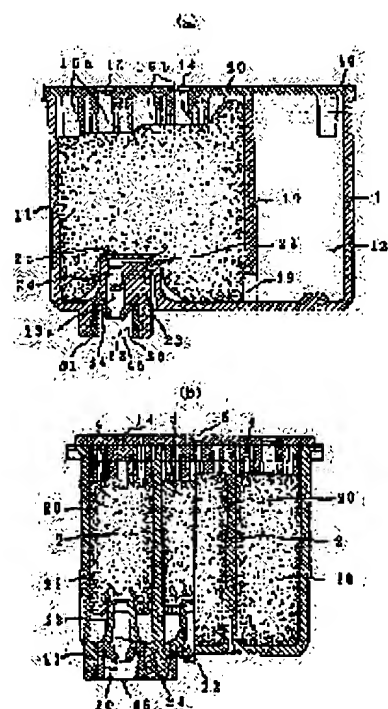
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(54) INK CARTRIDGE FOR INK JET PRINTER

(57)Abstract:

PURPOSE: To mount an ink cartridge by light force while absorbing positional shift of a certain degree.

CONSTITUTION: This ink cartridge is equipped with an ink chamber 12, a foam chamber 11 housing a porous member 20 absorbing ink and an ink supply port 13 supplying ink to a recording head through a porous member 20 and a funnel-shaped packing member 30 expanded upwardly is provided to the ink supply port. When the ink supply needle of the recording head is inserted in the ink supply port 13, the tip of the ink supply needle comes into contact with the packing member elastically. At this time, since the packing member 30 is formed into a funnel shape, the packing material is easy to move so as to follow the ink supply needle and comes



into close contact with the needle by elasticity.

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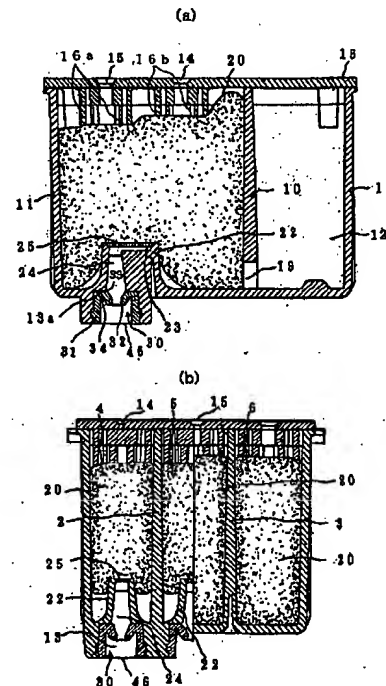
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(54) 【発明の名称】 インクジェットプリンタ用インクカートリッジ

(57) 【要約】

【目的】 インクカートリッジを軽い力で、かつ或程度の位置ずれを吸収して装着できるようにすること。

【構成】 インク室12と、インクを吸収する多孔質体20を収容するフォーム室11と、多孔質体20を介して記録ヘッドにインクを供給するインク供給口13とを備え、インク供給口に上方に拡開するロート状のパッキン部材30を備える。記録ヘッドのインク供給針がインク供給口13に挿入されると、インク供給針の先端がパッキン部材30に弾接する。この際、パッキン部材30がロート状に形成されているため、インク供給針に追従して移動しやすく、かつ弾性により確実に密着する。



【特許請求の範囲】

【請求項1】 インクを溜めるインク室と、前記インク室に連通路を介して連通するとともに前記インクを吸収する多孔質体を収容するフォーム室と、前記多孔質体を介して記録ヘッドにインクを供給するインク供給口とを備えたインクカートリッジにおいて、前記インク供給口に上方に拡開するロート状のパッキン部材を備えたインクジェットプリンタ用インクカートリッジ。

【請求項2】 前記パッキン部材は、前記インク供給口の内面で支持される厚肉の筒状部と、薄肉部の接続部を介して前記筒状部に接続するテーパ部とから構成されている請求項1に記載のインクジェットプリンタ用インクカートリッジ。

【請求項3】 前記フォーム室とインク室の組みを複数一体とするとともに、各組に異なるインクを収容してなる請求項1に記載のインクジェットプリンタ用インクカートリッジ。

【請求項4】 前記インク供給口に連通する通路を備えた凸部が底面に形成され、前記凸部により前記多孔質体を部分的に弾圧してインク供給口近傍の圧縮率を部分的に高めてなる請求項1または3に記載のインクジェットプリンタ用インクカートリッジ。

【請求項5】 前記フォーム室の前記インク供給口と対向する内側に前記多孔質体を前記インク供給口に押圧する突起が形成されている請求項1または4に記載のインクジェットプリンタ用インクカートリッジ。

【請求項6】 前記多孔質体の体積が、前記フォーム室の容積より大きく選択されている請求項1、4または5に記載のインクジェットプリンタ用インクカートリッジ。

【請求項7】 前記凸部の上面に前記通路の断面積よりも大きな凹部が形成され、その上面にフィルターが設けられている請求項1に記載のインクジェットプリンタ用インクカートリッジ。

【請求項8】 前記インク室が隔壁により複数の部屋に分割されている請求項1に記載のインクジェットプリンタ用インクカートリッジ。

【請求項9】 前記インク室の内面に上下に延びるリブが形成されている請求項1に記載のインクジェットプリンタ用インクカートリッジ。

【請求項10】 インクを溜めるインク室と、前記インク室に連通路を介して連通するとともに前記インクを吸収する多孔質体を収容するフォーム室とを有し、前記多孔質体を介して記録ヘッドにインクを供給するインク供給口を備えたインクカートリッジにおいて、前記フォーム室、及びインク室が減圧状態に保持されているとともに、前記フォーム室とインク室とが常時は前記連通路に弾接する前記多孔質体の表面張力により決まる圧力差が維持され、また前記多孔質体のインクの消費

により前記圧力差が維持されなくなった時点で、前記圧力差が生じるまで前記インク室から前記多孔質体にインクを供給するインクジェットプリンタ用インクカートリッジ。

【請求項11】 前記フォーム室とインク室の組みを複数一体とするとともに、各組に異なるインクを収容してなる請求項10に記載のインクジェットプリンタ用インクカートリッジ

【請求項12】 前記連通路の下部に段差を有し、その下方に前記インク室とフォーム室とを接続する溝が形成されている請求項10に記載のインクジェットプリンタ用インクカートリッジ。

【請求項13】 前記連通路に連通させて前記フォーム室側の壁部に空間を確保する突起が形成されている請求項10に記載のインクジェットプリンタ用インクカートリッジ。

【請求項14】 前記連通路の下方にはインク室側が高くなる段差が形成されている請求項10に記載のインクジェット式プリンタ用インクカートリッジ。

【請求項15】 前記インク室とフォーム室を区画する壁部の前記フォーム室側に前記連通路に連通して上方に延びる細溝が形成されている請求項10に記載のインクジェットプリンタ用インクカートリッジ。

【請求項16】 前記フォーム室の前記インク供給口と対向する内側に前記多孔質体を前記インク供給口に押圧する突起が形成されている請求項10に記載のインクジェットプリンタ用インクカートリッジ。

【請求項17】 前記多孔質体の体積が、前記フォーム室の容積より大きく選択されている請求項10または16に記載のインクジェットプリンタ用インクカートリッジ。

【請求項18】 前記インク室が隔壁により複数の部屋に分割されている請求項10に記載のインクジェットプリンタ用インクカートリッジ。

【請求項19】 前記インク室の内面に上下に延びるリブが形成されている請求項10に記載のインクジェットプリンタ用インクカートリッジ。

【請求項20】 インクを溜めるインク室と、前記インク室に連通路を介して連通するとともに前記インクを吸収する多孔質体を収容するフォーム室とを有し、前記多孔質体を介して記録ヘッドにインクを供給するインク供給口を備えたインクカートリッジにおいて、前記インク室、及び前記フォーム室が減圧状態に維持するとともに、使用時に開封可能な非通気性シール材により封止された大気連通路が設けられているインクジェットプリンタ用インクカートリッジ。

【請求項21】 前記大気連通路が蛇行溝として表面に形成されている請求項20に記載のインクジェットプリンタ用インクカートリッジ。

【請求項22】 前記シール材は、本体と、括れ部を介

して接続する舌片とにより構成されている請求項20に記載のインクジェットプリンタ用インクカートリッジ。

【請求項23】 前記括れ部を境とするようにして前記本体と前記舌片とに異なるパターン、または色が印刷されている請求項22に記載のインクジェットプリンタ用インクカートリッジ。

【請求項24】 前記インク室が隔壁により複数の部屋に分割されている請求項20に記載のインクジェットプリンタ用インクカートリッジ。

【請求項25】 前記インク室の内面に上下に延びるリブが形成されている請求項20に記載のインクジェットプリンタ用インクカートリッジ。

【請求項26】 前記フォーム室の前記インク供給口と対向する内側に前記多孔質体を前記インク供給口に押圧する突起が形成されている請求項20に記載のインクジェットプリンタ用インクカートリッジ。

【請求項27】 前記多孔質体の体積が、前記フォーム室の容積より大きく選択されている請求項20または26に記載のインクジェットプリンタ用インクカートリッジ。

【発明の詳細な説明】

【0001】

【産業上の利用分野】本発明は、キャリッジにインクジェット式記録ヘッドとインクカートリッジを搭載し、インクの補給をカートリッジの交換で行うインクジェットプリンタに適したインクカートリッジに関する。

【0002】

【従来の技術】インクジェット式記録ヘッドを搭載したキャリッジにインク収容体を搭載する形式のインクジェット式プリンタにあっては、キャリッジの移動によるインクの揺動に起因する水頭圧の変動や、泡立ちによる印字不良を防止するために、欧州公開特許第581531号公報に記載されたようにインク収容容器を2つの領域に分割し、記録ヘッド側に多孔質体を収容し、また他方の領域にインクを収容するようにしたものが提案されている。

【0003】このような構造を採ると、記録ヘッドへのインクの供給が多孔質体を介して行なわれるため、インクの揺動に起因する不都合を可及的に防止することができる。しかしながら、記録ヘッドと多孔質体との接合は、容器の側部に穿設された通孔に記録ヘッドに連通する突起を押圧することにより行なわれるため、圧電振動子をインク吐出用のアクチュエータとして使用するインクジェット式記録ヘッドのように、圧力発生室への気泡の混入を嫌う記録ヘッドには適用できないという問題がある。

【0004】このような問題を解消するために、図12(a)に示したように記録ヘッドのインク供給針の周面に弾接するリングAを使用することも考えられるが、カートリッジ装着時に大きな摩擦力が生じて、記録ヘッドやキャリッジに負担がかかるばかりでなく、各リン

グがその外周をカートリッジ本体Bに支持されているため、記録ヘッドのインク供給針との位置に誤差が存在すると、装着が極めて困難になり、特に図12(b)に示したように3色のカラータンクC、D、Eを一体としたカートリッジでは装着が不可能になる虞があるという問題がある。

【0005】

【発明が解決しようとする課題】本発明はこのような問題に鑑みてなされたものであって、その目的とするところは、軽い装着力と大きな余裕をもって装着することができ、また可及的に小さなデッドスペースで記録ヘッドと高い気密性を保持して記録ヘッドへの気泡の混入を確実に防止することができ、さらには印字可能な期間中はフォーム室の負圧を確実に維持できるインクジェット式プリンタ用のインクカートリッジを提供することである。

【0006】

【課題を解決するための手段】このような問題を解消するために本発明においては、インクを溜めるインク室と、前記インク室に通孔を介して連通するとともに前記インクを吸収する多孔質体を収容するフォーム室と、前記多孔質体を介して記録ヘッドにインクを供給するインク供給口とを備えたインクカートリッジにおいて、前記インク供給口に上方に拡開するロート状のバックイン部材を備える。

【0007】

【作用】記録ヘッドのインク供給針がインク供給口に挿入されると、インク供給針の先端がバックイン部材に弾接する。この際、バックイン部材が上方に拡開するロート状に形成されているため、インク供給針に追従して移動しやすく、かつ弾性により密着するため、インク供給針とインク供給口との相対的な位置ずれを吸収して確実に封止する。

【0008】

【実施例】そこで以下に本発明の詳細を図示した実施例の基づいて説明する。図1(a)、(b)は、本発明の一実施例を示すものであって、図中符号1は、本体容器で、図2に示したように仕切り板2、3より3つの部屋4、5、6に分割され、また各部屋4、5、6はそれぞれ中仕切り10、10、10によりインクを吸収するに適した多孔質体20を収容するフォーム室11と、インクを収容するインク室12に分離されている。

【0009】そして多孔質体20は、それ自体の体積がフォーム室11の容積よりも大きく選ばれ、フォーム室11には圧縮されて収容されている。

【0010】また、フォーム室11とインク室12と収容されるインク量は、フォーム室11側が20乃至30%程度多くなるように容積比が選択されている。

【0011】このようにフォーム室11側のインク量をインク室12のインク量よりも多く設定しておくことに

より、3色のインクを1つのカートリッジで提供する場合、各色インクの消費量のアンバランスに起因するインク室液面のばらつきを視覚的に認識しにくくして、インクの残存量に対する消費者の無用な心配を無くすることができ、また、カートリッジ廃棄時には、インクが多孔質体に吸収されているから、流れ出しを防止して環境の保護を図ることができる。

【0012】各フォーム室11の下端には記録ヘッドのインク供給針50と係合するインク供給口13、13、13が設けられ、また容器本体1の上端はフォーム室11に対向する位置にそれぞれ2つ1組みのインク注入口14、15を有する蓋体16で封止されている。

【0013】蓋体16の裏面のフォーム室11に位置する領域には、インク注入口14、15を取り囲むように突起16a、16bが形成されていて、これらの突起16a、16bにより多孔質体20がインク供給口13の形成されている底面に押圧されている。

【0014】そして、これら突起16a、16bの内、インク供給口13に対向する方の突起16aを、インク供給口13から離れた方の突起16bよりも下方側に位置するように長く形成して、インク供給口13近傍を最も高い圧力で圧縮するようになっている。

【0015】各フォーム室11の底部には、多孔質体20を蓋体16と協同して圧縮するための凸部22が形成されていて、この上端に一定の開口面積を有する空室を形成する凹部23と、これに一端が連通し、他端が後述するパッキンに連通する通路24が設けられ、さらに凹部23の上他端にフィルター25が固定されている。

【0016】30は、パッキン部材で、インク供給口13の下端に設けられたゴム等の弾性材料で形成されて上方に拡開するロート状のパッキンとして構成されている。そして下端は他の部分に比較して厚肉の筒状部31として構成され、またテーパ部32の周縁上端33がインク供給口13の段部13aと当接し、さらにテーパ部32との境界が薄肉の接続部34として構成されている。

【0017】これにより、筒状部31によりインク供給口13に確実に保持され、また周縁上端33が段部13aで上方に移動するのを阻止されるため、インク供給針の着脱に際してインク供給口13にしっかりと固定されることになる。またインク供給針との気密性を確保するテーパ部32は薄肉の接続部34によりインク供給口13に固定されているから、変形を来すことなく或程度移動可能となり、このため、インク供給針50との相対的な位置ずれを吸収しつつ、インク供給針との気密性を確保することができる。

【0018】また、フォーム室11とインク室12を区分している中仕切り10は、容器1の底面から一定の高さまで連続した長孔を形成して気液分離用の連通孔19が設けられ、この連通孔19に一部が接し、この連通孔

19に或程度弾圧された状態でフォーム室11に多孔質体20が収容されている。

【0019】一方、カラーインクカートリッジよりも比較的小さく製作されるものの、インク室12の容積が有色のインクよりも多くなるブラックインクのカートリッジは、図3に示したようにインク室12とフォーム室11とを区画する中仕切り10と容器本体1の側壁1aとの間に底面から上部近傍まで延びる隔壁17を形成して、インク室11を2つの部屋12a、12bに分割して、後述するインク注入時の負圧や、また使用時の外圧による容器全体の変形を防いで、インクの漏れだしを防止するように構成されている。なお、分割された各部屋12a、12bは、中仕切り10の連通孔19を介してフォーム室11で接続されているが、隔壁17の下部に連通孔を設けてもよい。

【0020】またキャリッジに搭載されたとき、外部から見易い位置の壁、この実施例では側壁1aには、内面に上下に延びる複数条のリブ18、18が形成されていて、インクを壁面1aから速やかに降下させるとともに、コントラストを大きくしてインクの残量をたやすく検知できるように構成されている。なお、図中符号19aは、中仕切り10のフォーム室11側の面に形成された後述する溝部を示している。

【0021】図4は前述した蓋体16の一実施例を示すもので、図中符号14、15は、インク注入用の孔で、多孔質体が収容されている領域に形成されており、インク注入用の孔14には、蛇行した溝40、40、40を介して大気連通口41、41、41に接続されている。

【0022】これら溝40、40、40は、後述するインク注入作業が終了した段階で、インク注入用の孔14、15、及び大気連通口41を覆うシール42が貼着されたときにキャピラリチューブを形成するようになっている。このシール42には大気連通口41に至る途中に設けられた括れ部43を介して一部が蓋体16から突出する舌片45が形成されている。このような構成により舌片45を蓋体16から引き剥がすと、舌片45だけを括れ部43から容易に分離でき、大気連通口41だけを露出させることができる。

【0023】このシール42は、溝40、40、40を常時封止する本体44の表面には文字やイラスト等のパターンが印刷されているとともに、括れ部43を介して本体44と接続する舌片45には色やパターン等を違えて印刷が施されている。

【0024】例えば、本体44は、地膚色を青色とするとともに、黒色で文字やイラストが印刷されているのに対して、舌片45は黄色や赤色など本体44の地膚色に対してコントラストの高い色を地膚色とし、黒色系や青色系を中心とする色の文字やイラストが印刷されている。このように本体44と舌片45との色や、パターン

を明確に異ならせることにより、使用者に対して舌片45の引き剥がしを喚起することが可能となる。

【0025】このように構成されたカートリッジは、インク供給口をフィルム46により封止するとともに、インク注入用の口14、15に気密的に注入針を挿入し、一方の注入針を排気手段に、また他方の注入針を閉塞する。

【0026】この状態で排気手段を作動させると、フォーム室11、及びインク室12が減圧される。所定の圧力まで減圧した段階で、排気操作を停止し、他方の注入針を計量管に連通させると、計量管に收容されているインクが一旦、多孔質体20に吸収され、ついで連通孔19を経由してインク室12に流入する。

【0027】計量管により規定された量のインクが流入した段階で、蓋体16の表面にシール42を貼着して注入口14、15及び蛇行溝40、及び連通孔41を減圧下で封止することにより、フォーム室11、及びインク室12は減圧状態を維持されることになる。

【0028】このように構成されたカートリッジは、その使用に際して、蓋体16の舌片45を剥がすと、舌片45が括れ部43を境にして本体44から分離される。これによりインク注入口14が溝40を介して大気連通孔41に連通する。使用状態においては各フォーム室4、5、6は、蛇行する長い溝40を介して大気に連通することになるから、通気性を確保しつつインクの蒸発を防止することができる。

【0029】この状態でインクカートリッジのインク供給口13を記録ヘッドのインク供給針50に位置合わせして押し込むと、図5(a)に示したようにインク供給針50は、そのテーパ部51がシール46を貫通してパッキン部材30の孔に当接する。パッキン部材30は、上方に拡張しているため、インク供給針50のテーパ部51に弾圧されて弾性変形しながら、パッキン部材30を貫通する。

【0030】このようなインク供給針50をパッキン部材30に挿通する形態で使用すれば、たとえ記録ヘッドのインク供給針とパッキンの中心との間に水平方向に若干の位置ずれが存在しても、インク供給針の先端がパッキン部材30の孔に係合しさえすれば、テーパ部32が接続部34の弾性によりインク供給針50に追従するため、インク供給口13とインク供給針50とを確実に封止することができる。

【0031】そして、インクカートリッジ装着直後における記録ヘッドへのインクの充填時や、インク吐出能力回復操作時のように記録ヘッドに負圧を作用させてカートリッジからインクを強制的に記録ヘッドに流入させる場合には、カートリッジ側に大きな負圧が作用するため、カートリッジと大気とを隔てているパッキン部材30のテーパ部32がインクカートリッジ側に変形する。

【0032】この結果、パッキン部材30のテーパ部3

2が圧力差によりインク供給針50に弾圧されて、より一層、高いシール性を発揮することになる。

【0033】またインク供給針50が貫通するまで押し込むことなく、図5(b)に示したようにインク供給針50のテーパ部51がパッキン部材30のテーパ部32に弾接しさえすれば、テーパ部32に下方への弾性力が蓄積されるから、インク供給針50との気密性を確保することができる。

【0034】このような使用形態によればインク供給針50の先端が直接シールされるため、デッドスペースが極めて小さく、かつ押し込みによるピストン効果に起因する空気の注入を防止できる。

【0035】この状態で、記録ヘッドのノズル開口側から負圧を作用させると、多孔質体20に吸収されているインクが通孔24からインク供給針の通孔51、51を経由して記録ヘッドに流れ込む。

【0036】所定量のインクが消費されて、多孔質体20のインク量が少なくなると、液位が低下すると、インク室12の圧力が連通孔19近傍の多孔質体20のインク保持力に打勝って連通孔19からインク室12に気泡が侵入する。これによりインク室12の圧力が上昇してインクがフォーム室11に流れ込む。

【0037】フォーム室11に流れ込んだインクは多孔質体20に吸収されてフォーム室11のインク液位を若干上昇させ、連通孔19近傍における多孔質体20のインク保持力とインク室12の圧力が平衡した時点で、インク室12からフォーム室11へのインクの流れ込みが停止する。

【0038】図6はこの過程を示すもので、図中符号Fはフォーム室11の多孔質体20の水頭圧を、また符号Gはインク室12のインク量を示しており、この図からの明らかなように多孔質体20に当初充填されているインクが一定量w1まで消費されて多孔質体20の水頭圧が所定の値、インク室12の圧力が連通孔19近傍の多孔質体20のインク保持力に打勝つ程度まで低下すると、連通孔19近傍の多孔質体20のインク保持力がインク室12の圧力とバランスを回復するまで段階的にインク室12からフォーム室11にインクが徐々に流れ込む。

【0039】この結果、インク室12のインク量が徐々に低下するものの、多孔質体20の水頭圧はほぼ一定に維持され、記録ヘッドに一定の圧力差でもってインクを供給することが可能となる。

【0040】記録ヘッドにより所定量w2までインクが消費されると、インク室12のインクが無くなるものの、多孔質体20には依然としてインク室12からフォーム室11に間断的にインクが供給されていたのと同等のインクが残っている。

【0041】したがって多孔質体20に吸収されているインク量でもって更に印刷が可能となる。規定量w3の

インクが消費されてしまうと、多孔質体20からのインクの供給が不能となる。

【0042】そして、インク室12のインクが全て多孔質体20に吸収された時点から印刷が不能となるまでになお一定量 ΔT のインクを記録ヘッドに供給することができるから、インク室12のインクの有無がカートリッジ全体のインクのニアエンドを表示することになり、この段階で新しいカートリッジを準備すれば速やかにインクを補給することが可能となる。

【0043】ところで、前述したように本発明のインクカートリッジは、印刷中も内部を負圧に保持する必要上、前述のインク供給口とインク供給針との気密性確保に加えて、インク室12からフォーム室11へのインク供給プロセスが極めて重要な要因となる。そこで、次に、インク室12からフォーム室11へのインクの供給を管理するための構造について説明する。

【0044】図7に示した実施例は、フォーム室11とインク室12の境界にインク室側が高くなった段差部60を形成するとともに、その下部に両室を接続する溝61を形成したものである。

【0045】この実施例によれば、連通孔19に接する多孔質体20を段差部60で確実に受け止めて、この近傍の圧縮率を高め、連通孔19を介してのインク室12とフォーム室11との圧力差を確実に確保することができるばかりでなく、インク室12のインクが少なくなった段階で、溝61によりインク室12のインクを集めて、これを多孔質体20に吸収させることができるため、インク室のインクを無駄なく記録ヘッドに供給することができる。

【0046】図8に示した実施例は、インク室12の底面をフォーム室11側よりも高くして段差62を形成し、この段差62で多孔質体20の下部を受け止めて連通孔19近傍での多孔質体20の圧縮率を高めるとともに、必要に応じてインク室12からフォーム室11に向かう傾斜63が付けられている。

【0047】この実施例によれば、インク室11のインクを連通孔19に片寄らせて集めることが可能となり、この結果キャリッジの傾きなどに関りなく、インク室12のインクを確実に記録ヘッドに供給することができる。

【0048】図9に示した実施例は、フォーム室11とインク室12を区画している中仕切りの連通孔19の上部に連通するようにして、フォーム室側に前述した細い溝部19a（図2、図3を参照）を形成するとともに、さらにインク室12からフォーム室11への空気の通路を確保するために、溝部19aの下端に貫通部19bを形成したものである。

【0049】この実施例によれば、細い溝部19aで形成される空間を介して多孔質体20の上部を連通孔19に連通させることになる。

【0050】この結果、多孔質体20の上部の比較的毛细管力が小さな領域と細い溝部19aを介して連通孔19が接続するため、インクと空気との置換を円滑に行わせることができ、インク室12のインクを確実にフォーム室11に流れ込ませてインクの供給ミスを防止することができる。

【0051】図10は、本発明の他の実施例を示すものであって、図中符号65は、フォーム室12の底部に設けられた馬蹄形の突部で、連通孔19の近傍に空間を確保して、インク室12のインクをフォーム室11に流れ込みやすくしたものである。

【0052】なお、上述の実施例においては、フォーム室11とインク室12とを1枚の中仕切り10により区画するようににしているが、単一色のインクカートリッジにあつては図11（a）、図11（b）に示したように、フォーム室70の2方、または3方を取り囲むようにインク室71を形成し、フォーム室70とインク室71とを区画する壁72、72、72の少なくとも1つに連通孔73を形成することにより、インクカートリッジ全体の容積に比較して大量のインクを収容することができるばかりでなく、インクの有無を広い角度から確認することができる。なお、図中符号74は、インク供給口を示す。

【0053】

【発明の効果】以上説明したように本発明においては、インクを溜めるインク室と、インク室に通孔を介して連通するとともに前記インクを吸収する多孔質体を収容するフォーム室と、多孔質体を介して記録ヘッドにインクを供給するインク供給口とを備えたインクカートリッジにおいて、インク供給口に上方に拡開するロート状のパッキン部材を備えたので、記録ヘッドのインク供給針の先端がパッキン部材に弾接し、パッキン部材のロート状の形状によりインク供給針に追従しつつ、弾性により密着して、インク供給針とインク供給口との相対的な位置ずれを吸収して確実に封止することができる。

【図面の簡単な説明】

【図1】図（a）、（b）は、それぞれ本発明をカラーインクカートリッジに適用した場合の一実施例を示す断面図である。

【図2】同上インクカートリッジのインク容器本体の一実施例を示す斜視図である。

【図3】黒インク用カートリッジのインク容器本体の一実施例を示す斜視図である。

【図4】蓋体のフォーム室側の構造を示す上面図で、図（a）はシールが未貼着の状態を、また図（b）はシールを貼着した状態を示すものである。

【図5】図（a）、（b）は、それぞれ同上インクカートリッジを記録ヘッドに装着した状態を示す図である。

【図6】インクの消費量と水頭圧、及びインク室のインク量との関係を示す線図である。

【図7】フォーム室とインク室との境界領域の構造を示す実施例の図である。

【図8】フォーム室とインク室との境界領域の構造の他の実施例を示す図である。

【図9】図(a)、(b)は、それぞれフォーム室とインク室との境界近傍の構造の他の実施例を縦断面、及びA-A線での断面構造を示す図である。

【図10】図(a)、(b)は、それぞれフォーム室とインク室との境界近傍の構造の他の実施例を示す縦断面図、及び横断面図である。

【図11】図(a)、(b)は、それぞれインクカートリッジの他の実施例を示す断面図である。

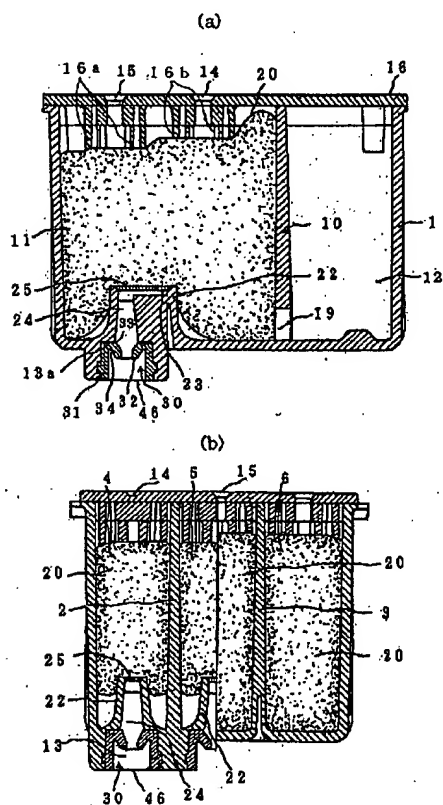
【図12】図(a)、(b)は、それぞれ従来のインクカートリッジの一例を示す図である。

【符号の説明】

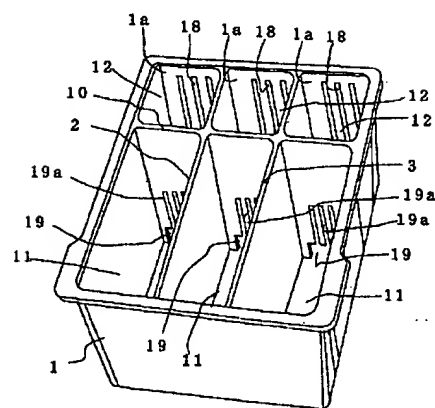
- 1 カートリッジ本体
- 2、3 仕切り板
- 10 中仕切り
- 11 フォーム室

- 12 インク室
- 13 インク供給口
- 14、15 インク注入用の孔
- 16 蓋体
- 17 隔壁
- 18 リブ
- 19 連通孔
- 19a 溝部
- 20 多孔質体
- 22 多孔質体圧縮用の凸部
- 23 凹部
- 24 通孔
- 25 フィルター
- 30 パッキン
- 31 筒状部
- 32 テーパー部
- 40 溝
- 41 大気連通口
- 42 シール

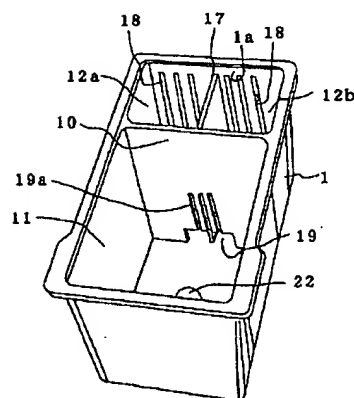
【図1】



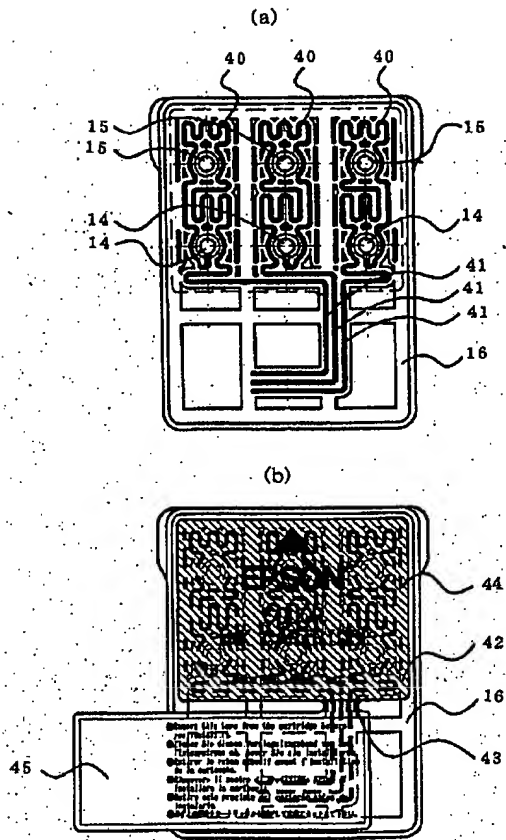
【図2】



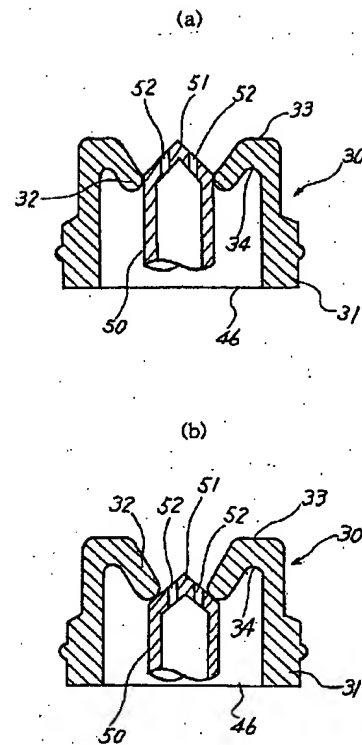
【図3】



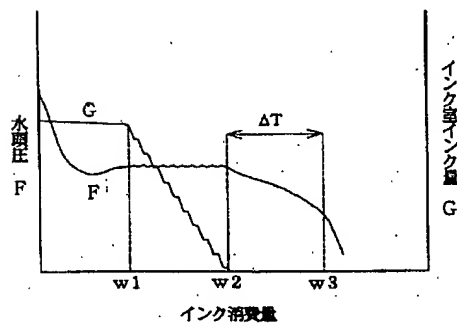
【図4】



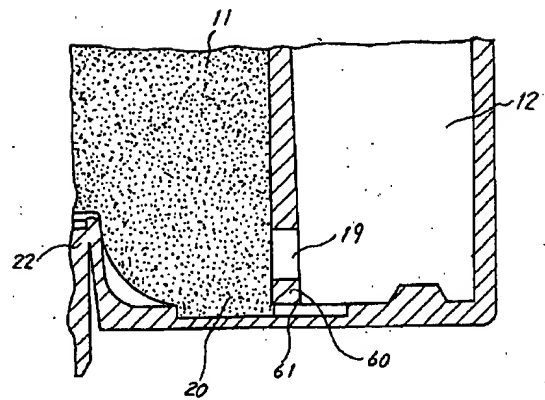
【図5】



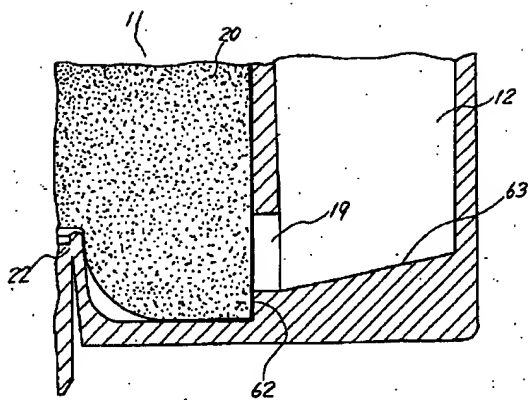
【図6】



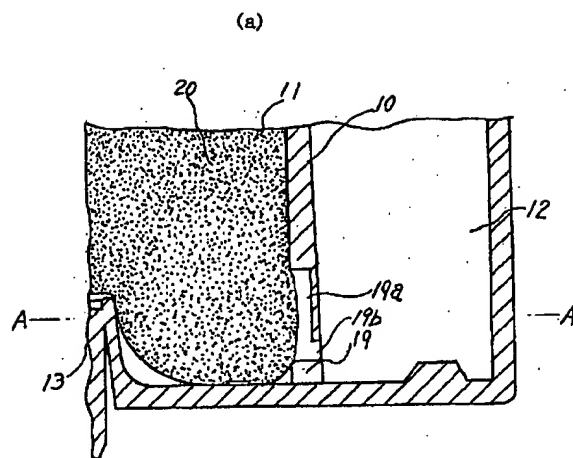
【図7】



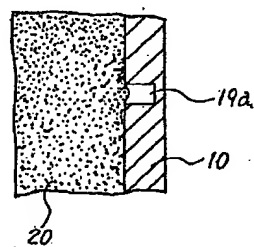
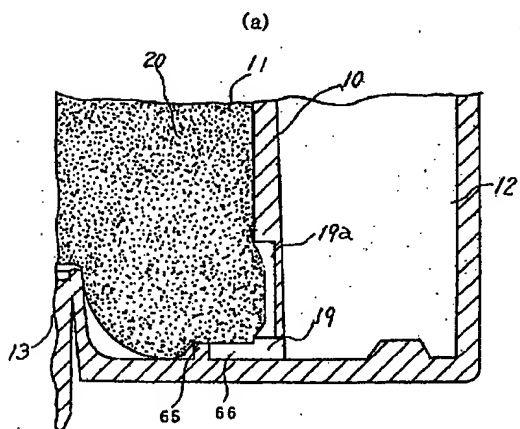
【図8】



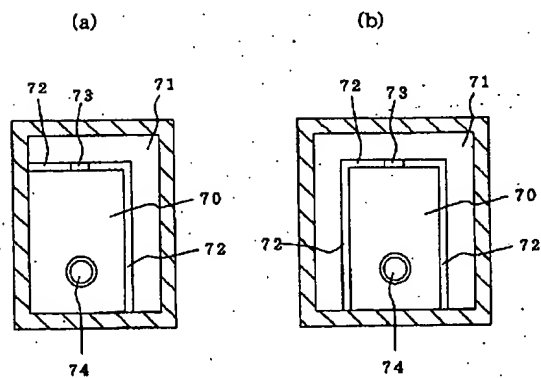
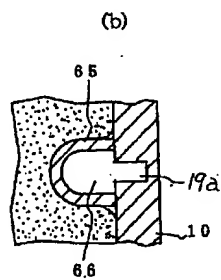
【図9】



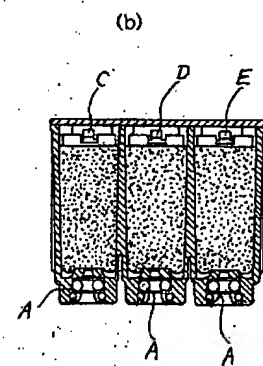
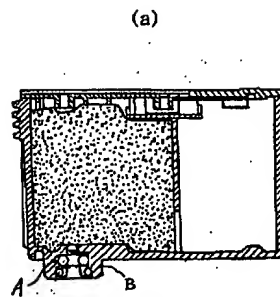
【図10】



【図11】



【図 12】



フロントページの続き

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CLAIMS

[Claim(s)]

[Claim 1] the funnel extended up to said ink feed hopper in the ink cartridge equipped with the ink room which collects ink, the form room in which the porous body which absorbs said ink is held while it is open for free passage through a free passage hole in said ink room, and the ink feed hopper which supplies ink to a recording head through said porous body -- the ink cartridge for ink jet printers equipped with the packing member of a **.

[Claim 2] Said packing member is an ink cartridge for ink jet printers according to claim 1 which consists of a heavy-gage tubed part supported by the inside of said ink feed hopper, and the taper section connected to said tubed part through the connection of a thin-walled part.

[Claim 3] The ink cartridge for ink jet printers according to claim 1 which comes to hold ink which is different in each class while making two or more **** of said form room and ink room into one.

[Claim 4] The ink cartridge for ink jet printers according to claim 1 or 3 which heights equipped with the through-hole which is open for free passage to said ink feed hopper are formed in a base, oppresses said porous body partially by said heights, and comes to raise the compressibility near the ink feed hopper partially.

[Claim 5] The ink cartridge for ink jet printers according to claim 1 or 4 by which the projection which presses said porous body to said ink feed hopper is formed in said ink feed hopper of said form room, and the inside which counters.

[Claim 6] The ink cartridge for ink jet printers according to claim 1, 4, or 5 as which the volume of said porous body is chosen more greatly than the volume of said form room.

[Claim 7] The ink cartridge for ink jet printers according to claim 1 by which a bigger crevice than the cross section of said through-hole is formed in the top face of said heights, and the filter is prepared in the top face.

[Claim 8] The ink cartridge for ink jet printers according to claim 1 by which said ink room is divided into two or more rooms by the septum.

[Claim 9] The ink cartridge for ink jet printers according to claim 1 in which the rib prolonged up and down in the inside of said ink room is formed.

[Claim 10] It has the ink room which collects ink, and the form room in which the porous body which absorbs said ink while it is open for free passage through a free passage hole in said ink room is held. In the ink cartridge equipped with the ink feed hopper which supplies ink to a recording head through said porous body, while said form room and the ink room are held at the reduced pressure condition When the differential pressure it is decided with the surface tension of said porous body which always **** to said free passage hole that said form room and ink room will be was maintained and said differential pressure is no longer maintained by consumption of the ink of said porous body The ink cartridge for ink jet printers which supplies ink to said porosity from said ink room until said differential pressure arises.

[Claim 11] The ink cartridge for ink jet printers according to claim 10 which comes to hold ink which is different in each class while making two or more **** of said form room and ink room into one [claim 12] The ink cartridge for ink jet printers according to claim 10 in which it has a level difference in the lower part of said free passage hole, and the slot which connects said ink room and form room caudad is formed.

[Claim 13] The ink cartridge for ink jet printers according to claim 10 in which the projected part which said free passage hole is made open for free passage, and secures space to the wall by the side of said form room is formed.

[Claim 14] The ink cartridge for ink jet printers according to claim 10 in which the level difference to which an ink room side becomes high under said free passage hole is formed.

[Claim 15] The ink cartridge for ink jet printers according to claim 10 in which the rill which is open for free passage to said free passage hole, and is prolonged up in said form room side of the wall which divides said ink room and form room is formed.

[Claim 16] The ink cartridge for ink jet printers according to claim 10 by which the projection which presses said porous body to said ink feed hopper is formed in said ink feed hopper of said form room, and the inside which counters.

[Claim 17] The ink cartridge for ink jet printers according to claim 10 or 16 as which the volume of said porous body is chosen more greatly than the volume of said form room.

[Claim 18] In KUJIE according to claim 10 and the ink cartridge for printers by which said ink room is divided into two or more rooms by the septum.

[Claim 19] The ink cartridge for ink jet printers according to claim 10 in which the rib prolonged up and down in the inside of said ink room is formed.

[Claim 20] It has the ink room which collects ink, and the form room in which the porous body which absorbs said ink while it is open for free passage through a free passage hole in said ink room is held. In the ink cartridge equipped with the ink feed hopper which supplies ink to a recording head through said porous body, while maintaining said ink room and said form room in the reduced pressure condition The ink cartridge for ink jet printers in which atmospheric-air free passage opening the closure was carried out [opening] by the non-permeability sealant which can be opened at the time of use is prepared.

[Claim 21] The ink cartridge for ink jet printers according to claim 20 by which said atmospheric-air free passage opening is formed in the front face as a meandering slot.

[Claim 22] Said sealant is an ink cartridge for ink jet printers according to claim 20 constituted with the body and the tongue-shaped piece connected through the constriction section.

[Claim 23] A pattern as differ in said body and said tongue-shaped piece bordering on said constriction section, or the ink cartridge for ink jet printers according to claim 22 by which the color is printed.

[Claim 24] The ink cartridge for ink jet printers according to claim 20 by which said ink room is divided into two or more rooms by the septum.

[Claim 25] The ink cartridge for ink jet printers according to claim 20 in which the rib prolonged up and down in the inside of said ink room is formed.

[Claim 26] The ink cartridge for ink jet printers according to claim 20 by which the projection which presses said porous body to said ink feed hopper is formed in said ink feed hopper of said form room, and the inside which counters.

[Claim 27] The ink cartridge for ink jet printers according to claim 20 or 26 as which the volume of said porous body is chosen more greatly than the volume of said form room.

DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Industrial Application] This invention carries an ink jet type recording head and an ink cartridge in carriage, and relates to the ink cartridge suitable for the ink jet printer which supplies ink by exchange of a cartridge.

[0002]

[Description of the Prior Art] If it is in the ink jet printer of the format of carrying an ink hold object in the carriage which carried the ink jet type recording head In order to prevent fluctuation of the head resulting from rocking of the ink by migration of carriage, and poor printing by foaming What divides an ink hold container into two fields as indicated by the Europe public presentation patent No. 581531 official report, holds a porous body in a recording head side, and held ink in the field of another side is proposed.

[0003] If such structure is taken, since supply of the ink to a recording head will be performed through a porous body, it can prevent un-arranging resulting from rocking of ink as much as possible. however, the ink jet type recording head which uses a piezoelectric transducer as an actuator for ink regurgitation since junction to a recording head and a porous body is performed by pressing the projection which is open for free passage to a recording head to the through-hole drilled in the flank of a container -- there is a problem of being inapplicable in the recording head which dislikes mixing of the air bubbles to a pressure generating room like.

[0004] Although using O ring A which **** to the peripheral surface of the ink supply needle of a recording head is also considered as shown in drawing 12 (a) in order to solve such a problem Since a burden is not only placed on a recording head or carriage, but big frictional force arises at the time of cartridge wearing and O rings each are supported by the cartridge body B in the periphery, When an error exists in a location with the ink supply needle of a recording head, wearing becomes very difficult and there is a problem that there is a possibility that wearing may become impossible, in the cartridge which made one the color tanks C, D, and E of three colors as shown especially in drawing 12 (b).

[0005]

[Problem(s) to be Solved by the Invention] This invention is made in view of such a problem, and it can equip with the place made into the purpose with the light wearing force and big allowances, and a recording head and high airtightness can be held by small dead space as much as possible, mixing of the air bubbles of record HEDDOHE can be prevented certainly, and it is offering the ink cartridge for ink jet printers which can maintain the negative pressure of a form room certainly during a further printable period.

[0006]

[Means for Solving the Problem] the funnel extended up to said ink feed hopper in the ink cartridge equipped with the ink room which collects ink in this invention, the form room in which the porous body which absorbs said ink is held while it is open for free passage through a through-hole in said ink room, and the ink feed hopper which supplies ink to a recording head through said porous body in order to solve such a problem -- it has the packing member of a **.

[0007]

[Function] If the ink supply needle of a recording head is inserted in an ink feed hopper, the tip of an ink supply needle **** to a packing member. under the present circumstances, the funnel which a packing member extends up -- in order to follow an ink supply needle, to be easy to move, since it is formed in the **, and to stick with elasticity, the relative location gap with an ink supply needle and an ink feed hopper is absorbed, and it closes certainly.

[0008]

[Example] Then, the example illustrating the detail of this invention is based on below, and it explains to it. Drawing 1 (a) and (b) are what shows one example of this invention. The sign 1 in drawing As shown in drawing 2, it is divided into three rooms 4, 5, and 6 from diaphragms 2 and 3 by the body container. Moreover, each part stores 4, 5, and 6 are divided into the form room 11 in which the porous body 20 suitable for absorbing ink by the partitions 10, 10, and 10 among its ***** is held, and the ink room 12 in which ink is held.

[0009] And the volume of itself is chosen more greatly than the volume of the form room 11, and the porous body 20 is compressed and held in the form room 11.

[0010] moreover, the form room 11, the ink room 12, and the amount of ink held -- the form room 11 side -- 20 -- or the volume ratio is chosen so that it may increase about 30%.

[0011] Thus, by setting up more amounts of ink by the side of the form room 11 than the amount of ink of the ink room 12 Dispersion in the ink room oil level resulting from the imbalance of the consumption of each color ink is made hard to recognize visually, when offering the ink of three colors by one cartridge. Unnecessary worries of the consumer to the amount of survival of ink can be lost, and since ink is absorbed by the porous body at the time of cartridge abandonment, outflow can be prevented and environmental protection can be aimed at.

[0012] The ink feed hoppers 13, 13, and 13 which engage with the ink supply needle 50 of a recording head are formed in the lower limit of each form room 11, and the closure of the upper limit of the body 1 of a container is carried out with the lid 16 which has the two 1-set Mino ink inlets 14 and 15 in the location which counters the form room 11, respectively.

[0013] The porous body 20 is pressed by the base in which Projections 16a and 16b are formed in the field located in the form room 11 of the rear face of a lid 16 so that the ink inlets 14 and 15 may be surrounded, and the ink feed hopper 13 is formed of these projections 16a and 16b.

[0014] And projection 16a of the direction which counters the ink feed hopper 13 among these projections 16a and 16b is formed for a long time so that it may be located in a lower part side rather than projection 16b of the direction which is separated from the ink feed hopper 13, and about 13 ink feed hopper is compressed by the highest pressure.

[0015] The crevice 23 which the heights 22 for compressing a porous body 20 in cooperation with a lid 16 are formed in the pars basilaris ossis occipitalis of each form room 11, and forms the vacant room which has a fixed opening area in this upper limit, and the through-hole 24 which an end is open for free passage to this, and is open for free passage to packing which the other end mentions later are formed, and the filter 25 is being further fixed to the upper other end of a crevice 23.

[0016] the funnel which it is formed with spring materials, such as rubber which 30 is a packing member and was prepared in the lower limit of the ink feed hopper 13, and is extended up -- it is constituted as packing of a **. And a lower limit is constituted as a heavy-gage tubed part 31 as compared with other parts, and the periphery upper limit 33 of the taper section 32 contacts step 13a of the ink feed hopper 13, and the boundary with the taper section 32 is further constituted as a connection 34 of thin meat.

[0017] Since it is prevented that it is certainly held by the tubed part 31 at the ink feed hopper 13, and the periphery upper limit 33 moves up by step 13a by this, on the occasion of attachment and detachment of an ink supply needle, it will be firmly fixed to the ink feed hopper 13. Moreover, the taper section 32 which secures airtightness with an ink supply needle can secure airtightness with an ink supply needle, absorbing the relative location gap with the ink supply needle 50 for a ** grade movable next door and this reason, since it is being fixed to the ink feed hopper 13 by

the connection 34 of thin meat without causing deformation.

[0018] Moreover, while having classified the form room 11 and the ink room 12, partition 10 forms the long hole which continued from the base of a container 1 to fixed height, the free passage hole 19 for vapor liquid separation is formed, a part touches this free passage hole 19, and where ** grade suppression is carried out at this free passage hole 19, the porous body 20 is held in the form room 11.

[0019] On the other hand, although manufactured comparatively smaller than a color ink cartridge, the cartridge of the black ink in which the volume of the ink room 12 increases more than colored ink As shown in drawing 3 , while dividing the ink room 12 and the form room 11, the septum 17 prolonged [to / from a base / near the upper part] is formed between partition 10 and side-attachment-wall 1a of the body 1 of a container. The ink room 11 is divided into two rooms 12a and 12b, and the negative pressure at the time of the ink impregnation which mentions later, and deformation of the whole container according to the external pressure at the time of use again are prevented, and it is constituted so that the leakage broth of ink may be prevented. In addition, the divided each part stores 12a and 12b may prepare a free passage hole in the lower part of a septum 17, although it connects through the free passage hole 19 of the inside partition 10 at the form room 11.

[0020] Moreover, when carried in carriage, a wall of a location legible from the outside and this example are consisted of by side-attachment-wall 1a so that contrast may be enlarged and the residue of ink can be detected easily, while the ribs 18 and 18 of two or more articles prolonged up and down inside are formed and dropping ink promptly from wall surface 1a. In addition, sign 19 in drawing a shows the slot which was formed in the field by the side of the form room 11 of the inside partition 10 and which is mentioned later.

[0021] Drawing 4 shows one example of the lid 16 mentioned above, and the signs 14 and 15 in drawing are formed in the field in which it is a hole for ink impregnation and the porous body is held, and are connected to the atmospheric-air free passage openings 41, 41, and 41 through the slots 40, 40, and 40 which lay in a zigzag line in the hole 14 for ink impregnation.

[0022] These slots 40, 40, and 40 are the phases which the ink impregnation activity mentioned later ended, and when the holes 14 and 15 and the atmospheric-air free passage opening 41 for ink impregnation are stuck on the wrap seal 42, they form a capillary tube. it results in the atmospheric-air free passage opening 41 at this seal 42 -- on the way -- the tongue-shaped piece 45 which was boiled and prepared and with which it is narrow with the tongue-shaped piece and a part projects from a lid 16 through the section 43 -- formation -- now, it is. If such a configuration tears off a tongue-shaped piece 45 from a lid 16, it can be narrow, only a tongue-shaped piece 45 can be easily separated from the section 43, and only the atmospheric-air free passage opening 41 can be exposed.

[0023] While patterns, such as an alphabetic character and an illustration, are printed by the front face of the body 44 with which this seal 42 always closes slots 40, 40, and 40, a color, a pattern, etc. are changed in the tongue-shaped piece 45 connected with a body 44 through the constriction section 43, and printing is performed.

[0024] For example, while a body 44 makes ***** blue, it is black, and a tongue-shaped piece 45 makes the high color of contrast ***** to ***** of a body 44, such as yellow and red, to the alphabetic character and the illustration being printed, and the alphabetic character and illustration of a color consisting mainly of a black system or a blue system are printed. Thus, it enables ** for a tongue-shaped piece 45 to lengthen to a user, and to evoke ** the color of a body 44 and a tongue-shaped piece 45, and by changing a pattern clearly.

[0025] Thus, the constituted cartridge inserts an impregnation needle in the openings 14 and 15 for ink impregnation in airtight, and blockades the impregnation needle of another side for one impregnation needle for an exhaust air means again while it closes an ink feed hopper with a film 46.

[0026] If an exhaust air means is operated in this condition, the form room 11 and the ink room 12 will be decompressed. If exhaust air actuation is suspended and measuring tubing is made to open the impregnation needle of another side for free passage in the phase decompressed to the predetermined pressure, the ink held in measuring tubing will be absorbed by the porous body 20, and, subsequently will once flow into the ink room 12 via the free passage hole 19.

[0027] The form room 11 and the ink room 12 have a reduced pressure condition maintained by sticking a seal 42 on the front face of a lid 16 in the phase in which the ink of the amount specified with measuring tubing flowed, and closing inlets 14 and 15, the meandering slot 40, and the free passage opening 41 under reduced pressure.

[0028] Thus, a tongue-shaped piece 45 will be narrow and the constituted cartridge will be separated from a body 44 bordering on the section 43, if the tongue-shaped piece 45 of a lid 16 is removed on the occasion of the use. This is open for free passage to the atmospheric-air free passage opening 41 through the ink inlet 14 and furrow 40. Since each form rooms 4, 5, and 6 will be open for free passage to atmospheric air through the long slot 40 which lies in a zigzag line in a busy condition, evaporation of ink can be prevented securing permeability.

[0029] If alignment of the ink feed hopper 13 of an ink cartridge is carried out to the ink supply needle 50 of a recording head and it is stuffed into it in this condition, as shown in drawing 5 (a), that taper section 51 will penetrate a seal 46, and the ink supply needle 50 will contact the hole of the packing member 30. The packing member 30 penetrates the packing member 30, being oppressed by the taper section 51 of the ink supply needle 50, and carrying out elastic deformation to it, since it is extended up.

[0030] Since the taper section 32 will follow the ink supply needle 50 with the elasticity of a connection 34 if only the tip of an ink supply needle engages with the hole of the packing member 30 even if some location gap exists horizontally between the ink supply needle of a recording head, and the core of packing if it is used with the gestalt which inserts such an ink supply needle 50 in the packing member 30, the ink feed hopper 13 and the ink supply needle 50 can be closed certainly.

[0031] And in making negative pressure act on a recording head like [at the time of restoration of the ink to the recording head immediately after ink cartridge wearing, and ink regurgitation capacity recovery operation] and making ink flow into a recording head compulsorily from a cartridge, in order that big negative pressure may act on a cartridge side, the taper section 32 of the packing member 30 which has separated a cartridge and atmospheric air deforms into an ink cartridge side.

[0032] Consequently, the taper section 32 of the packing member 30 will be oppressed by the ink supply needle 50 by differential pressure, and will demonstrate still higher seal nature.

[0033] Moreover, since the elastic force of lower part HE is accumulated in the taper section 32 if only the taper section 51 of the ink supply needle 50 **** in the taper section 32 of the packing member 30, without pushing in until the ink supply needle 50 penetrates, as shown in drawing 5 (b), airtightness with the ink supply needle 50 is securable.

[0034] Since the direct seal of the tip of the ink supply needle 50 is carried out according to such a use gestalt, dead space is very small and can prevent impregnation of the air resulting from the piston effectiveness by pushing.

[0035] In this condition, if negative pressure is made to act from the nozzle orifice side of a recording head, the ink absorbed by the porous body 20 will flow into a recording head via the through-holes 51 and 51 of an ink supply needle from a through-hole 24.

[0036] If the ink of the specified quantity is consumed, the amount of ink of a porous body 20 decreases and liquid level falls, the pressure of the ink room 12 will overcome the ink holding power of the about 19 free passage hole porous body 20, and air bubbles will trespass upon the ink room 12 from the free passage hole 19. The pressure of the ink room 12 rises by this, and ink flows into the form room 11.

[0037] When it is absorbed by the porous body 20, at least the liquid ink of the form room 11 is raised a little and the ink holding power of a porous body 20 and the pressure of the ink room 12 in about 19 free passage hole balance, the influx of the ink of form room 11 HE suspends the ink which flowed into the form room 11 from the ink room 12.

[0038] Drawing 6 is what shows this process. The sign F in drawing the head of the porous body 20 of the form room 11 Sign G shows the amount of ink of the ink room 12, and the ink with which the porous body 20 is filled up at the beginning so that clearly from this drawing is consumed to a constant rate w1. Moreover, a value predetermined in the head of a porous body 20, If it falls to extent to which the pressure of the ink room 12 overcomes the ink holding power of the about 19 free passage hole porous body 20, ink will flow into the form room 11 gradually from the ink room 12 until the ink holding power of the about 19 free passage hole porous body 20 recovers the pressure and balance of the ink room 12.

[0039] Consequently, although the amount of ink of the ink room 12 falls gradually, the head of a porous body 20 is maintained almost uniformly, and it becomes possible [supplying ink to a recording head as fixed differential pressure is also].

[0040] If ink is consumed to the specified quantity w2 by the recording head, ink equivalent to ink still having been supplied to the form room 11 in intermission from the ink room 12 remains in the porous body 20 of that whose ink of the ink room 12 is lost.

[0041] Therefore, printing becomes being also in the amount of ink absorbed by the porous body 20 still more possible. If the ink of the amount w3 of conventions is consumed, supply of the ink from a porous body 20 will serve as impossible.

[0042] And since the ink of constant-rate ΔT can be supplied in addition to a recording head by the time printing becomes impossible from the time of all the ink of the ink room 12 being absorbed by the porous body 20, if the existence of the ink of the ink room 12 will display the near end of the ink of the whole cartridge and prepares a new cartridge in this phase, it will become possible to supply ink promptly.

[0043] By the way, as mentioned above, in addition to airtight reservation with the above-mentioned ink feed hopper and an ink supply needle, the ink cartridge of this invention becomes a factor with the very important ink supply process to the form room 11 from the ink room 12 on the need of holding the interior to negative pressure, also during printing. Then, the structure for managing the supply of ink in the form room 11 from the ink room 12 is explained below.

[0044] The example shown in drawing 7 forms the slot 61 which connects both ** to the lower part while an ink room side forms in the boundary of the form room 11 and the ink room 12 the level difference section 60 which became high.

[0045] According to this example, the porous body 20 which touches the free passage hole 19 is certainly caught in the level difference section 60. In the phase whose ink of the ink room 12 decreased the differential pressure of the ink room 12 which raises the compressibility of this near and minds the free passage hole 19, and the form room 11 is not only certainly securable,

but Since the ink of the ink room 12 can be collected by the slot 61 and a porous body 20 can be made to absorb this, the ink of an ink room can be supplied to a recording head without futility. [0046] The example shown in drawing 8 makes the base of the ink room 12 higher than the form room 11 side, and forms a level difference 62, and while catching the lower part of a porous body 20 with this level difference 62 and raising the compressibility of the about 19 free passage hole porous body 20, the inclination 63 which goes to the form room 11 from the ink room 12 if needed is attached.

[0047] According to this example, it becomes possible to bias the ink of the ink room 11 toward the free passage hole 19, and to collect it, and as a result, there is no **** in the inclination of carriage etc., and the ink of the ink room 12 can be certainly supplied to a recording head.

[0048] As the example shown in drawing 9 is open for free passage in the upper part of the free passage hole 19 of a partition while having divided the form room 11 and the ink room 12, while forming thin slot 19a (see drawing 2 and drawing 3) mentioned above in the form room side, in order to secure the path of the air from the ink room 12 to the form room 11 further, it forms penetration section 19b in the lower limit of slot 19a.

[0049] According to this example, the free passage hole 19 is made to open the upper part of a porous body 20 for free passage through the space formed by thin slot 19a.

[0050] Consequently, since the free passage hole 19 connects through the field of the upper part of a porous body 20 where the capillary tube force is comparatively small, and thin slot 19a, can make the permutation of ink and air perform smoothly, the ink of the ink room 12 is made to flow into the form room 11 certainly, and the supply mistake of ink can be prevented.

[0051] It is made easy for drawing 10 to show other examples of this invention, and for the sign 65 in drawing to be the horseshoe-shaped projected part prepared in the pars basilaris ossis occipitalis of the form room 12, to secure space near the free passage hole 19, and to flow the ink of the ink room 12 into the form room 11.

[0052] In addition, in an above-mentioned example, although the form room 11 and the ink room 12 are carried out for dividing by the partition 10 in one sheet If it was in the ink cartridge of a single color, as it was shown in drawing 11 (a) and drawing 11 (b) By forming the ink room 71 so that the methods of two or the methods of three of the form room 70 may be surrounded, and forming the free passage hole 73 in at least one of the walls 72, 72, and 72 which divides the form room 70 and the ink room 71 It not only can hold a lot of ink, but as compared with the volume of the whole ink cartridge, it can check the existence of ink from a large include angle. In addition, the sign 74 in drawing shows an ink feed hopper.

[0053]

[Effect of the Invention] The ink room which collects ink in this invention as explained above, In the ink cartridge equipped with the form room in which the porous body which absorbs said ink is held while it is open for free passage through a through-hole in an ink room, and the ink feed hopper which supplies ink to a recording head through a porous body the funnel extended up to an ink feed hopper, since it had the packing member of a ** the tip of the ink supply needle of a recording head -- a packing member -- ****(ing) -- the funnel of a packing member -- following an ink supply needle with the configuration of a **, it can stick with elasticity, the relative location gap with an ink supply needle and an ink feed hopper can be absorbed, and it can close certainly.

TECHNICAL FIELD

[Industrial Application] This invention carries an ink jet type recording head and an ink cartridge in carriage, and relates to the ink cartridge suitable for the ink jet printer which supplies ink by exchange of a cartridge.

PRIOR ART

[Description of the Prior Art] If it is in the ink jet printer of the format of carrying an ink hold object in the carriage which carried the ink jet type recording head In order to prevent fluctuation of the head resulting from rocking of the ink by migration of carriage, and poor printing by foaming What divides an ink hold container into two fields as indicated by the Europe public presentation patent No. 581531 official report, holds a porous body in a recording head side, and held ink in the field of another side is proposed.

[0003] If such structure is taken, since supply of the ink to a recording head will be performed through a porous body, it can prevent un-arranging resulting from rocking of ink as much as possible. however, the ink jet type recording head which uses a piezoelectric transducer as an actuator for ink regurgitation since junction to a recording head and a porous body is performed by pressing the projection which is open for free passage to a recording head to the through-hole drilled in the flank of a container -- there is a problem of being inapplicable in the recording head which dislikes mixing of the air bubbles to a pressure generating room like.

[0004] Although using O ring A which **** to the peripheral surface of the ink supply needle of a recording head is also considered as shown in drawing 12 (a) in order to solve such a problem Since a burden is not only placed on a recording head or carriage, but big frictional force arises at the time of cartridge wearing and O rings each are supported by the cartridge body B in the periphery, When an error exists in a location with the ink supply needle of a recording head, wearing becomes very difficult and there is a problem that there is a possibility that wearing may become impossible, in the cartridge which made one the color tanks C, D, and E of three colors as shown especially in drawing 12 (b).

EFFECT OF THE INVENTION

[Effect of the Invention] the funnel extended up to an ink feed hopper in the ink cartridge equipped with the ink room which collects ink in this invention, the form room in which the porous body which absorbs said ink is held while it is open for free passage through a through-hole in an ink room, and the ink feed hopper which supplies ink to a recording head through a porous body as explained above -- it had the packing member of a **. therefore, the tip of the ink supply needle of a recording head -- a packing member -- ****(ing) -- the funnel of a packing member -- following an ink supply needle with the configuration of a **, it can stick with elasticity, the relative location gap with an ink supply needle and an ink feed hopper can be absorbed, and it can close certainly.

TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] This invention is made in view of such a problem, and it can equip with the place made into the purpose with the light wearing force and big allowances, and a recording head and high airtightness can be held by small dead space as much as possible, mixing of the air bubbles of record HEDDOHE can be prevented certainly, and it is offering the ink cartridge for ink jet printers which can maintain the negative pressure of a form room certainly during a further printable period.

MEANS

[Means for Solving the Problem] the funnel extended up to said ink feed hopper in the ink cartridge equipped with the ink room which collects ink in this invention, the form room in which the porous body which absorbs said ink is held while it is open for free passage through a through-hole in said ink room, and the ink feed hopper which supplies ink to a recording head through said porous body in order to solve such a problem -- it has the packing member of a **.

OPERATION

[Function] If the ink supply needle of a recording head is inserted in an ink feed hopper, the tip of an ink supply needle **** to a packing member. under the present circumstances, the funnel which a packing member extends up -- in order to follow an ink supply needle, to be easy to move, since it is formed in the **, and to stick with elasticity, the relative location gap with an ink supply needle and an ink feed hopper is absorbed, and it closes certainly.

EXAMPLE

[Example] Then, the example illustrating the detail of this invention is based on below, and it explains to it. Drawing 1 (a) and (b) are what shows one example of this invention. The sign 1 in drawing As shown in drawing 2 , it is divided into three rooms 4, 5, and 6 from diaphragms 2 and 3 by the body container. Moreover, each part stores 4, 5, and 6 are divided into the form room 11 in which the porous body 20 suitable for absorbing ink by the partitions 10, 10, and 10 among its ***** is held, and the ink room 12 in which ink is held.

[0009] And the volume of itself is chosen more greatly than the volume of the form room 11, and the porous body 20 is compressed and held in the form room 11.

[0010] moreover, the form room 11, the ink room 12, and the amount of ink held -- the form room 11 side -- 20 -- or the volume ratio is chosen so that it may increase about 30%.

[0011] Thus, by setting up more amounts of ink by the side of the form room 11 than the amount of ink of the ink room 12 Dispersion in the ink room oil level resulting from the imbalance of the consumption of each color ink is made hard to recognize visually, when offering the ink of three

colors by one cartridge. Unnecessary worries of the consumer to the amount of survival of ink can be lost, and since ink is absorbed by the porous body at the time of cartridge abandonment, outflow can be prevented and environmental protection can be aimed at.

[0012] The ink feed hoppers 13, 13, and 13 which engage with the ink supply needle 50 of a recording head are formed in the lower limit of each form room 11, and the closure of the upper limit of the body 1 of a container is carried out with the lid 16 which has the two 1-set Mino ink inlets 14 and 15 in the location which counters the form room 11, respectively.

[0013] The porous body 20 is pressed by the base in which Projections 16a and 16b are formed in the field located in the form room 11 of the rear face of a lid 16 so that the ink inlets 14 and 15 may be surrounded, and the ink feed hopper 13 is formed of these projections 16a and 16b.

[0014] And projection 16a of the direction which counters the ink feed hopper 13 among these projections 16a and 16b is formed for a long time so that it may be located in a lower part side rather than projection 16b of the direction which is separated from the ink feed hopper 13, and about 13 ink feed hopper is compressed by the highest pressure.

[0015] The crevice 23 which the heights 22 for compressing a porous body 20 in cooperation with a lid 16 are formed in the pars basilaris ossis occipitalis of each form room 11, and forms the vacant room which has a fixed opening area in this upper limit, and the through-hole 24 which an end is open for free passage to this, and is open for free passage to packing which the other end mentions later are formed, and the filter 25 is being further fixed to the upper other end of a crevice 23.

[0016] the funnel which it is formed with spring materials, such as rubber which 30 is a packing member and was prepared in the lower limit of the ink feed hopper 13, and is extended up -- it is constituted as packing of a **. And a lower limit is constituted as a heavy-gage tubed part 31 as compared with other parts, and the periphery upper limit 33 of the taper section 32 contacts step 13a of the ink feed hopper 13, and the boundary with the taper section 32 is further constituted as a connection 34 of thin meat.

[0017] Since it is prevented that it is certainly held by the tubed part 31 at the ink feed hopper 13, and the periphery upper limit 33 moves up by step 13a by this, on the occasion of attachment and detachment of an ink supply needle, it will be firmly fixed to the ink feed hopper 13. Moreover, the taper section 32 which secures airtightness with an ink supply needle can secure airtightness with an ink supply needle, absorbing the relative location gap with the ink supply needle 50 for a ** grade movable next door and this reason, since it is being fixed to the ink feed hopper 13 by the connection 34 of thin meat without causing deformation.

[0018] Moreover, while having classified the form room 11 and the ink room 12, partition 10 forms the long hole which continued from the base of a container 1 to fixed height, the free passage hole 19 for vapor liquid separation is formed, a part touches this free passage hole 19, and where ** grade suppression is carried out at this free passage hole 19, the porous body 20 is held in the form room 11.

[0019] On the other hand, although manufactured comparatively smaller than a color ink cartridge, the cartridge of the black ink in which the volume of the ink room 12 increases more than colored ink As shown in drawing 3, while dividing the ink room 12 and the form room 11, the septum 17 prolonged [to / from a base / near the upper part] is formed between partition 10 and side-attachment-wall 1a of the body 1 of a container. The ink room 11 is divided into two rooms 12a and 12b, and the negative pressure at the time of the ink impregnation which mentions later, and deformation of the whole container according to the external pressure at the time of use again are prevented, and it is constituted so that the leakage broth of ink may be

prevented. In addition, the divided each part stores 12a and 12b may prepare a free passage hole in the lower part of a septum 17, although it connects through the free passage hole 19 of the inside partition 10 at the form room 11.

[0020] Moreover, when carried in carriage, a wall of a location legible from the outside and this example are consisted of by side-attachment-wall 1a so that contrast may be enlarged and the residue of ink can be detected easily, while the ribs 18 and 18 of two or more articles prolonged up and down inside are formed and dropping ink promptly from wall surface 1a. In addition, sign 19 in drawing a shows the slot which was formed in the field by the side of the form room 11 of the inside partition 10 and which is mentioned later.

[0021] Drawing 4 shows one example of the lid 16 mentioned above, and the signs 14 and 15 in drawing are formed in the field in which it is a hole for ink impregnation and the porous body is held, and are connected to the atmospheric-air free passage openings 41, 41, and 41 through the slots 40, 40, and 40 which lay in a zigzag line in the hole 14 for ink impregnation.

[0022] These slots 40, 40, and 40 are the phases which the ink impregnation activity mentioned later ended, and when the holes 14 and 15 and the atmospheric-air free passage opening 41 for ink impregnation are stuck on the wrap seal 42, they form a capillary tube. it results in the atmospheric-air free passage opening 41 at this seal 42 -- on the way -- the tongue-shaped piece 45 which was boiled and prepared and with which it is narrow with the tongue-shaped piece and a part projects from a lid 16 through the section 43 -- formation -- now, it is. If such a configuration tears off a tongue-shaped piece 45 from a lid 16, it can be narrow, only a tongue-shaped piece 45 can be easily separated from the section 43, and only the atmospheric-air free passage opening 41 can be exposed.

[0023] While patterns, such as an alphabetic character and an illustration, are printed by the front face of the body 44 with which this seal 42 always closes slots 40, 40, and 40, a color, a pattern, etc. are changed in the tongue-shaped piece 45 connected with a body 44 through the constriction section 43, and printing is performed.

[0024] For example, while a body 44 makes ***** blue, it is black, and a tongue-shaped piece 45 makes the high color of contrast ***** to ***** of a body 44, such as yellow and red, to the alphabetic character and the illustration being printed, and the alphabetic character and illustration of a color consisting mainly of a black system or a blue system are printed. Thus, it enables ** for a tongue-shaped piece 45 to lengthen to a user, and to evoke ** the color of a body 44 and a tongue-shaped piece 45, and by changing a pattern clearly.

[0025] Thus, the constituted cartridge inserts an impregnation needle in the openings 14 and 15 for ink impregnation in airtight, and blockades the impregnation needle of another side for one impregnation needle for an exhaust air means again while it closes an ink feed hopper with a film 46.

[0026] If an exhaust air means is operated in this condition, the form room 11 and the ink room 12 will be decompressed. If exhaust air actuation is suspended and measuring tubing is made to open the impregnation needle of another side for free passage in the phase decompressed to the predetermined pressure, the ink held in measuring tubing will be absorbed by the porous body 20, and, subsequently will once flow into the ink room 12 via the free passage hole 19.

[0027] The form room 11 and the ink room 12 have a reduced pressure condition maintained by sticking a seal 42 on the front face of a lid 16 in the phase in which the ink of the amount specified with measuring tubing flowed, and closing inlets 14 and 15, the meandering slot 40, and the free passage opening 41 under reduced pressure.

[0028] Thus, a tongue-shaped piece 45 will be narrow and the constituted cartridge will be

separated from a body 44 bordering on the section 43, if the tongue-shaped piece 45 of a lid 16 is removed on the occasion of the use. This is open for free passage to the atmospheric-air free passage opening 41 through the ink inlet 14 and furrow 40. Since each form room 4, 5, and 6 will be open for free passage to atmospheric air through the long slot 40 which lies in a zigzag line in a busy condition, evaporation of ink can be prevented securing permeability.

[0029] If alignment of the ink feed hopper 13 of an ink cartridge is carried out to the ink supply needle 50 of a recording head and it is stuffed into it in this condition, as shown in drawing 5 (a), that taper section 51 will penetrate a seal 46, and the ink supply needle 50 will contact the hole of the packing member 30. The packing member 30 penetrates the packing member 30, being oppressed by the taper section 51 of the ink supply needle 50, and carrying out elastic deformation to it, since it is extended up.

[0030] Since the taper section 32 will follow the ink supply needle 50 with the elasticity of a connection 34 if only the tip of an ink supply needle engages with the hole of the packing member 30 even if some location gap exists horizontally between the ink supply needle of a recording head, and the core of packing if it is used with the gestalt which inserts such an ink supply needle 50 in the packing member 30, the ink feed hopper 13 and the ink supply needle 50 can be closed certainly.

[0031] And in making negative pressure act on a recording head like [at the time of restoration of the ink to the recording head immediately after ink cartridge wearing, and ink regurgitation capacity recovery operation] and making ink flow into a recording head compulsorily from a cartridge, in order that big negative pressure may act on a cartridge side, the taper section 32 of the packing member 30 which has separated a cartridge and atmospheric air deforms into an ink cartridge side.

[0032] Consequently, the taper section 32 of the packing member 30 will be oppressed by the ink supply needle 50 by differential pressure, and will demonstrate still higher seal nature.

[0033] Moreover, since the elastic force of lower part HE is accumulated in the taper section 32 if only the taper section 51 of the ink supply needle 50 **** in the taper section 32 of the packing member 30, without pushing in until the ink supply needle 50 penetrates, as shown in drawing 5 (b), airtightness with the ink supply needle 50 is securable.

[0034] Since the direct seal of the tip of the ink supply needle 50 is carried out according to such a use gestalt, dead space is very small and can prevent impregnation of the air resulting from the piston effectiveness by pushing.

[0035] In this condition, if negative pressure is made to act from the nozzle orifice side of a recording head, the ink absorbed by the porous body 20 will flow into a recording head via the through-holes 51 and 51 of an ink supply needle from a through-hole 24.

[0036] If the ink of the specified quantity is consumed, the amount of ink of a porous body 20 decreases and liquid level falls, the pressure of the ink room 12 will overcome the ink holding power of the about 19 free passage hole porous body 20, and air bubbles will trespass upon the ink room 12 from the free passage hole 19. The pressure of the ink room 12 rises by this, and ink flows into the form room 11.

[0037] When it is absorbed by the porous body 20, at least the liquid ink of the form room 11 is raised a little and the ink holding power of a porous body 20 and the pressure of the ink room 12 in about 19 free passage hole balance, the influx of the ink of form room 11 HE suspends the ink which flowed into the form room 11 from the ink room 12.

[0038] Drawing 6 is what shows this process. The sign F in drawing the head of the porous body 20 of the form room 11 Sign G shows the amount of ink of the ink room 12, and the ink with

which the porous body 20 is filled up at the beginning so that clearly from this drawing is consumed to a constant rate w_1 . Moreover, a value predetermined in the head of a porous body 20, If it falls to extent to which the pressure of the ink room 12 overcomes the ink holding power of the about 19 free passage hole porous body 20, ink will flow into the form room 11 gradually from the ink room 12 until the ink holding power of the about 19 free passage hole porous body 20 recovers the pressure and balance of the ink room 12.

[0039] Consequently, although the amount of ink of the ink room 12 falls gradually, the head of a porous body 20 is maintained almost uniformly, and it becomes possible [supplying ink to a recording head as fixed differential pressure is also].

[0040] If ink is consumed to the specified quantity w_2 by the recording head, ink equivalent to ink still having been supplied to the form room 11 in intermission from the ink room 12 remains in the porous body 20 of that whose ink of the ink room 12 is lost.

[0041] Therefore, printing becomes being also in the amount of ink absorbed by the porous body 20 still more possible. If the ink of the amount w_3 of conventions is consumed, supply of the ink from a porous body 20 will serve as impossible.

[0042] And since the ink of constant-rate ΔT can be supplied in addition to a recording head by the time printing becomes impossible from the time of all the ink of the ink room 12 being absorbed by the porous body 20, if the existence of the ink of the ink room 12 will display the near end of the ink of the whole cartridge and prepares a new cartridge in this phase, it will become possible to supply ink promptly.

[0043] By the way, as mentioned above, in addition to airtight reservation with the above-mentioned ink feed hopper and an ink supply needle, the ink cartridge of this invention becomes a factor with the very important ink supply process to the form room 11 from the ink room 12 on the need of holding the interior to negative pressure, also during printing. Then, the structure for managing the supply of ink in the form room 11 from the ink room 12 is explained below.

[0044] The example shown in drawing 7 forms the slot 61 which connects both ** to the lower part while an ink room side forms in the boundary of the form room 11 and the ink room 12 the level difference section 60 which became high.

[0045] According to this example, the porous body 20 which touches the free passage hole 19 is certainly caught in the level difference section 60. In the phase whose ink of the ink room 12 decreased the differential pressure of the ink room 12 which raises the compressibility of this near and minds the free passage hole 19, and the form room 11 is not only certainly securable, but Since the ink of the ink room 12 can be collected by the slot 61 and a porous body 20 can be made to absorb this, the ink of an ink room can be supplied to a recording head without futility.

[0046] The example shown in drawing 8 makes the base of the ink room 12 higher than the form room 11 side, and forms a level difference 62, and while catching the lower part of a porous body 20 with this level difference 62 and raising the compressibility of the about 19 free passage hole porous body 20, the inclination 63 which goes to the form room 11 from the ink room 12 if needed is attached.

[0047] According to this example, it becomes possible to bias the ink of the ink room 11 toward the free passage hole 19, and to collect it, and as a result, there is no **** in the inclination of carriage etc., and the ink of the ink room 12 can be certainly supplied to a recording head.

[0048] As the example shown in drawing 9 is open for free passage in the upper part of the free passage hole 19 of a partition while having divided the form room 11 and the ink room 12, while forming thin slot 19a (see drawing 2 and drawing 3) mentioned above in the form room side, in order to secure the path of the air from the ink room 12 to the form room 11 further, it forms

penetration section 19b in the lower limit of slot 19a.

[0049] According to this example, the free passage hole 19 is made to open the upper part of a porous body 20 for free passage through the space formed by thin slot 19a.

[0050] Consequently, since the free passage hole 19 connects through the field of the upper part of a porous body 20 where the capillary tube force is comparatively small, and thin slot 19a, can make the permutation of ink and air perform smoothly, the ink of the ink room 12 is made to flow into the form room 11 certainly, and the supply mistake of ink can be prevented.

[0051] It is made easy for drawing 10 to show other examples of this invention, and for the sign 65 in drawing to be the horseshoe-shaped projected part prepared in the pars basilaris ossis occipitalis of the form room 12, to secure space near the free passage hole 19, and to flow the ink of the ink room 12 into the form room 11.

[0052] In addition, in an above-mentioned example, although the form room 11 and the ink room 12 are carried out for dividing by the partition 10 in one sheet. If it was in the ink cartridge of a single color, as it was shown in drawing 11 (a) and drawing 11 (b). By forming the ink room 71 so that the methods of two or the methods of three of the form room 70 may be surrounded, and forming the free passage hole 73 in at least one of the walls 72, 72, and 72 which divides the form room 70 and the ink room 71. It not only can hold a lot of ink, but as compared with the volume of the whole ink cartridge, it can check the existence of ink from a large include angle. In addition, the sign 74 in drawing shows an ink feed hopper.

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] Drawing (a) and (b) are the sectional views showing one example at the time of applying this invention to a color ink cartridge, respectively.

[Drawing 2] It is the perspective view showing one example of the body of an ink container of an ink cartridge same as the above.

[Drawing 3] It is the perspective view showing one example of the body of an ink container of the cartridge for black ink.

[Drawing 4] It is the plan showing the structure by the side of the form room of a lid, and the condition that drawing (a) stuck the condition that a seal was not stuck, and drawing (b) stuck the seal is shown.

[Drawing 5] Drawing (a) and (b) are drawings showing the condition of having equipped the recording head with the ink cartridge same as the above, respectively.

[Drawing 6] It is the diagram showing the relation between the consumption of ink, a head, and the amount of ink of an ink room.

[Drawing 7] It is drawing of an example showing the structure of the border area of a form room and an ink room.

[Drawing 8] It is drawing showing other examples of the structure of the border area of a form room and an ink room.

[Drawing 9] Drawing (a) and (b) are drawings showing the longitudinal section and the cross-section structure in an A-A line for other examples of the structure near the boundary of a form room and an ink room, respectively.

[Drawing 10] Drawing (a) and (b) are drawing of longitudinal section showing other examples of

the structure near the boundary of a form room and an ink room, respectively, and a cross-sectional view.

[Drawing 11] Drawing (a) and (b) are the sectional views showing other examples of an ink cartridge, respectively.

[Drawing 12] Drawing (a) and (b) are drawings showing an example of the conventional ink cartridge, respectively.

[Description of Notations]

- 1 Cartridge Body
- 2 Three Diaphragm
- 10 Inside Partition
- 11 Form Room
- 12 Ink Room
- 13 Ink Feed Hopper
- 14 15 Hole for ink impregnation
- 16 Lid
- 17 Septum
- 18 Rib
- 19 Free Passage Hole
- 19a Slot
- 20 Porous Body
- 22 Heights for Porous Body Compression
- 23 Crevice
- 24 Through-hole
- 25 Filter
- 30 Packing
- 31 Tubed Part
- 32 Taper Section
- 40 Slot
- 41 Atmospheric-Air Free Passage Opening
- 42 Seal

CORRECTION OR AMENDMENT

[Kind of official gazette] Printing of amendment by the convention of 2 of Article 17 of Patent Law

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[Item(s) to be Amended] Claim

[Method of Amendment] Modification

[Proposed Amendment]

[Claim(s)]

[Claim 1] In the ink cartridge equipped with the ink feed hopper which engages with the ink supply needle which was open for free passage to the recording head, and was equipped with the taper section at the tip,

the funnel extended to the path of insertion of said ink supply needle -- the ink cartridge for ink jet printers by which the packing member of a ** is prepared in said ink feed hopper.

[Claim 2] Said packing member is an ink cartridge for ink jet printers according to claim 1 which consists of a heavy-gage tubed part supported by the inside of said ink feed hopper, and the taper section connected to said tubed part through the connection of a thin-walled part.

[Claim 3] The ink cartridge for ink jet printers according to claim 1 which it is divided into two or more rooms by the septum, said each part store boils, respectively, and said ink feed hopper is opening for free passage.

[Claim 4] In the ink cartridge equipped with the ink feed hopper which has the ink room which collects ink, and the form room in which the porous body which absorbs said ink while connecting with said ink room through a free passage hole is held, and supplies ink to a recording head through said porous body,

It is the ink cartridge for ink jet printers which supplies ink to said porous body from said ink room until said fixed differential pressure arises when it was maintained by the fixed differential pressure it is decided with the surface tension of said porous body which always **** to said free passage hole that the ink of said form room and ink room will be and said differential pressure is no longer maintained by consumption of the ink of said porous body, while said form room and the ink room are held at the reduced pressure condition.

[Claim 5] The ink cartridge for ink jet printers according to claim 4 which comes to hold ink which is different in each class while making two or more **** of said form room and ink room into one.

[Claim 6] The ink cartridge for ink jet printers according to claim 4 in which it has a level difference in the lower part of said free passage hole, and the slot which connects said ink room and form room caudad is formed.

[Claim 7] The ink cartridge for ink jet printers according to claim 4 in which the projected part which said free passage hole is made open for free passage, and secures space to the wall by the side of said form room is formed.

[Claim 8] The ink cartridge for ink jet printers according to claim 4 in which the level difference to which an ink room side becomes high under said free passage hole is formed.

[Claim 9] The ink cartridge for ink jet printers according to claim 4 in which the rill which is

open for free passage to said free passage hole, and is prolonged up in said form room side of the wall which divides said ink room and form room is formed.

[Claim 10] Said ink feed hopper of said form room, and the ink cartridge for ink jet printers according to claim 4 by which the projection which presses said porous body to said ink feed hopper is formed in the side which counters.

[Claim 11] The ink cartridge for ink jet printers according to claim 4 or 10 as which the volume of said porous body is chosen more greatly than the volume of said form room.

[Claim 12] The ink cartridge for ink jet printers according to claim 4 by which said ink room is divided into two or more rooms by the septum.

[Claim 13] The ink cartridge for ink jet printers according to claim 4 in which the rib prolonged up and down in the inside of said ink room is formed.

[Claim 14] In the ink cartridge equipped with the ink feed hopper which has the ink room which collects ink, and the form room in which the porous body which absorbs said ink while it is open for free passage through a free passage hole in said ink room is held, and supplies ink to a recording head through said porous body,

The ink cartridge for ink jet printers in which atmospheric-air free passage opening the closure was carried out [opening] by the non-permeability sealant which can be opened at the time of use is prepared while maintaining said ink room and said form room in the reduced pressure condition.

[Claim 15] The ink cartridge for ink jet printers according to claim 14 currently formed in the front face of the container with which said atmospheric-air free passage opening constitutes said cartridge as a meandering slot.

[Claim 16] Said sealant is an ink cartridge for ink jet printers according to claim 14 constituted by the body section and the tongue-shaped piece section which is narrow with said body section and is connected through the section.

[Claim 17] A pattern as differ in said body section and said tongue-shaped piece section bordering on said constriction section, or the ink cartridge for ink jet printers according to claim 16 by which the color is printed.

[Claim 18] The ink cartridge for ink jet printers according to claim 14 by which said ink room is divided into two or more rooms by the septum.

[Claim 19] The ink cartridge for ink jet printers according to claim 14 in which the rib prolonged up and down in the inside of said ink room is formed.

[Claim 20] The ink cartridge for ink jet printers according to claim 14 by which the projection which presses said porous body to said ink feed hopper is formed in said ink feed hopper of said form room, and the inside which counters.

[Claim 21] The ink cartridge for ink jet printers according to claim 14 or 20 as which the volume of said porous body is chosen more greatly than the volume of said form room.

[Claim 22] In the ink cartridge equipped with the ink feed hopper which has the ink room which collects ink, and the form room in which the porous body which absorbs said ink is held, and supplies ink to a recording head through said porous body,

It is divided by the septum equipped with the slot which said form room and ink room are equipped with said free passage hole which makes mutual open for free passage, and carries out opening to said form room side at said free passage hole,

The ink cartridge for ink jet printers by which said ink feed hopper is projected and formed in abbreviation parallel at said form room at said septum.

[Claim 23] In the ink cartridge which consists of a body of a container which equipped the

recording head with the ink feed hopper which supplies ink, and a lid which closes said body of a container,

An end carries out opening to the through tube which is open for free passage to the space of said body of a container at said through tube, the meandering slot where the other end is prolonged to other fields is formed in said lid, and the closure of said through tube and said meandering slot is carried out to it by the sealant,

The ink cartridge for ink jet printers from which said sealant is constituted by the body section and the tongue-shaped piece section which is narrow with said body section and is connected through the section.

[Claim 24] An end carries out opening to each of said through tube with the through tube which said body of a container is divided into the room in which two or more sorts of ink is held by the septum, and is open for free passage to said lid in each part store, the meandering slot where the other end is prolonged to other fixed fields is formed, and the closure of said through tube and said meandering slot is carried out by the sealant,

The ink cartridge for ink jet printers constituted by the tongue-shaped piece section in which said sealant is narrow with said body section, and connects with a body through the section, and closes said fixed field.